

WHAT IS CLAIMED IS:

1. A semiconductor device, comprising:
2 a gate oxide located over a substrate; and
3 a silicided gate electrode located over said gate oxide, said
4 silicided gate electrode including a first metal and a second
5 metal.

2. The semiconductor device as recited in Claim 1 further
2 including a dopant located within and configured to tune a work
3 function of said silicided gate electrode.

3. The semiconductor device as recited in Claim 2 wherein
2 said dopant is selected from a group consisting of:
3 boron;
4 phosphorous; and
5 arsenic.

4. The semiconductor device as recited in Claim 1 further
2 including source/drain regions located in said substrate proximate
3 said gate oxide and silicided source/drain contact regions located
4 in said source/drain regions, wherein said silicided source/drain
5 contact regions have a depth substantially different than a
6 thickness of said silicided gate electrode.

5. The semiconductor device as recited in Claim 4 wherein
2 said silicided gate electrode is silicided with a different metal
3 than said silicided source/drain contact regions.

6. The semiconductor device as recited in Claim 1 wherein
2 said first metal is cobalt and said second metal is nickel.

7. The semiconductor device as recited in Claim 6 wherein a
2 ratio of an atomic percent of said cobalt to said nickel in said
3 silicided gate electrode ranges from about 9:1 to about 2:3.

8. The semiconductor device as recited in Claim 7 wherein
2 said atomic percent ranges from about 3:1 to about 1:1.

9. The semiconductor device as recited in Claim 1 wherein
2 said silicided gate electrode has a thickness ranging from about
3 15 nm to about 150 nm.

10. A method for manufacturing a semiconductor device,
2 comprising:
3 placing a gate oxide over a substrate; and
4 forming a silicided gate electrode over said gate oxide, said

5 silicided gate electrode including a first metal and a second
6 metal.

11. The method as recited in Claim 10 wherein said forming
2 includes depositing a blanket layer of polysilicon material over a
3 blanket layer of gate oxide material, depositing a blanket layer of
4 a cobalt-nickel bilayer or a blanket layer of cobalt-nickel alloy
5 over said blanket layer of polysilicon material, and annealing said
6 layers to form a blanket layer of silicided gate electrode material
7 including cobalt and nickel.

12. The method as recited in Claim 11 further including
2 patterning said blanket layer of silicided gate electrode material
3 to form said silicided gate electrode including cobalt and nickel.

13. The method as recited in Claim 11 further including
2 implanting a dopant into said blanket layer of polysilicon material
3 to tune a work function of said silicided gate electrode.

14. The method as recited in Claim 13 further including
2 forming a capping layer over said cobalt-nickel bilayer or cobalt-
3 nickel alloy, said capping layer configured to affect a doping
4 profile of said dopant.

15. The method as recited in Claim 14 wherein said capping
2 layer comprises a transition metal-nitride.

16. The method as recited in Claim 11 wherein a ratio of a
2 thickness of said cobalt layer to a thickness of said nickel layer
3 ranges from about 9:1 to about 2:3.

17. The method as recited in Claim 11 wherein said cobalt -
2 nickel alloy has a Co_x to Ni_y ratio (x:y) ranging from about 9:1 to
3 about 2:3.

18. The method as recited in Claim 11 wherein a ratio of an
2 atomic percent of said cobalt to said nickel in said silicided gate
3 electrode ranges from about 9:1 to about 2:3.

19. The method as recited in Claim 10 further including
2 forming source/drain regions in said substrate and forming
3 silicided source/drain contact regions in said source/drain regions
4 subsequent to forming said silicided gate electrode.

20. An integrated circuit, comprising:

transistors located over a substrate, said transistors including;

a gate oxide located over said substrate;

a silicided gate electrode located over said gate oxide, said silicided gate electrode including a first metal and a second metal; and

an interlevel dielectric layer located over said substrate, said interlevel dielectric layer having interconnects located therein for contacting said transistors.